REMARKS/ARGUMENTS

Claims 1, 3, 5-6, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tobin et al. (USPN 5,972,804). Claims 2, 4, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tobin in view of Ibok (USPN 6,080,682).

1. Rejection of claim 1 under 35 U.S.C. 103(a):

Claim 1 is rejected under 35 U.S.C. 103(a), for reasons of record that can be found on pages 2-3 in the Office action identified above, which is part of paper No. 0905. To overcome this 103 rejection, claim 1 has been amended. No new matter is introduced. Reconsideration of the amended claim 1 is politely requested.

The Examiner stated that Tobin discloses a method of growing a gate oxide layer that renders claim 1 of the present application obvious. The applicant respectfully disagrees with. Tobin teaches a method of forming an oxynitride gate dielectric layer. Tobin teaches that the gate dielectric layer 206 consists of a thin interface layer 202 that is formed by optional Steps 50 and 60, and a bulk oxynitride gate dielectric layer 204 on layer 202 (abstract and through FIGS. 6-8). Tobin teaches that after the NH_3 or N_2O treatment (i.e., the optional Steps 50 and 60) of the surface of the semiconductor substrate, a LPCVD or RTCVD silicon nitride deposition process using dichlorosilane (DCS) and ammonia (NH_3) ambient is performed to *deposit* the bulk oxynitride gate dielectric layer 204 (col. 7, lines 53-61). The bulk oxynitride gate dielectric layer 204 is deposited on the thin interface thin layer 202, rather than grown on thin layer 202 by oxidation.

Further, Tobin teaches an optional Step 50 to provide a nitrided passivated top surface of the semiconductor substrate in order to ensure that any subsequent oxidation of

the silicon semiconductor substrate is reduced (col. 7, lines 21-25). Tobin teaches away that "said preliminary anneal process is carried out at a relatively low pressure"; "a nitrogen oxide thin layer with limited nitrogen-silicon bonds due to said relatively low pressure is formed on said silicon active area"; and "said limited nitrogen-silicon bonds prevents adverse effects on mobility of electrons in a channel region", as required by the amended claim 1.

It is respectfully noted that the pressure parameters taught by Ibok (US 6,080,682) cited by the Examiner are employed in a PECVD process, but not *anneal* process. The Examiner has stated no motivation that would cause one reasonably skilled in the art to modify and combine CVD pressure parameters employed in a PECVD process taught by Ibok with the steps taught by Tobin. There is nothing that the applicant can find in Ibok reference that would serve as motivation.

The applicant submits that none of the cited prior art references discloses a method of growing a gate oxide layer including the steps of "performing a preliminary anneal process, wherein said preliminary anneal process is carried out *at a relatively low pressure*... a nitrogen oxide thin layer *with limited nitrogen-silicon bonds due to said relatively low pressure* is formed on said silicon active area" and "after said preliminary anneal process, *growing* a gate oxide layer, *by oxidation*, on said nitrogen oxide thin layer", as required by the amended claim 1.

Accordingly, the applicant believes that the amended claim 1 is now in condition for allowance, and such action is therefore politely requested.

2. Rejection on claims 2-5 under 35 U.S.C. 103(a):

As claims 2-5 are dependent upon claim 1, they should be allowable if the amended

claim 1 is allowed. Reconsideration of claims 2-5 is therefore politely requested.

3. Rejection of claim 6 under 35 U.S.C. 103(a) and 112:

Claim 6 is rejected under 35 U.S.C. 103(a) and 112, for reasons of record that can be found on pages 2-3 in the Office action identified above, which is part of paper No. 0905. To overcome this 103 and 112 rejections, claim 6 has been amended. No new matter is introduced. Reconsideration of the amended claim 6 is politely requested.

Tobin teaches a method of forming an oxynitride gate dielectric layer. Tobin teaches that the gate dielectric layer 206 consists of a thin interface thin layer 202 that is formed by optional Steps 50 and 60, and a bulk oxynitride gate dielectric layer 204 on layer 202 (abstract and through FIGS. 6-8). Tobin teaches that after the NH_3 or N_2O treatment (i.e., the optional Steps 50 and 60) of the surface of the semiconductor substrate, a LPCVD or RTCVD silicon nitride deposition process using dichlorosilane (DCS) and ammonia (NH_3) ambient is performed to *deposit* the bulk oxynitride gate dielectric layer 204 (col. 7, lines 53-61). The bulk oxynitride gate dielectric layer 204 is deposited on the thin interface thin layer 202, rather than grown on thin layer 202 by oxidation.

Further, Tobin teaches an optional Step 50 to provide a nitrided passivated top surface of the semiconductor substrate in order to ensure that any subsequent oxidation of the silicon semiconductor substrate is reduced (col. 7, lines 21-25). Tobin teaches away that "a nitrogen oxide thin layer with limited nitrogen-silicon bonds is formed on said silicon active area" and "*said limited nitrogen-silicon bonds prevents adverse effects on mobility of electrons in a channel region*" as required by the amended claim 6.

The applicant submits that none of the cited prior art references discloses a method of *growing* a gate oxide layer including the steps of "performing a preliminary anneal

process... a nitrogen oxide thin layer with limited nitrogen-silicon bonds is formed on said silicon active area" and "after said preliminary anneal process, *growing* a gate oxide layer, *by oxidation*, on said nitrogen oxide thin layer", as required by the amended claim 6.

Accordingly, the applicant believes that the amended claim 6 is now in condition for allowance, and such action is therefore politely requested.

4. Rejection on claims 7 under 35 U.S.C. 103(a):

The applicant believes that claim 7 is allowable. The pressure parameters taught by Ibok (US 6,080,682) cited by the Examiner are employed in a PECVD process, but not *anneal* process. The Examiner has stated no motivation that would cause one reasonably skilled in the art to modify and combine CVD pressure parameters employed in a PECVD process taught by Ibok with the steps taught by Tobin. There is nothing that the applicant can find in Ibok reference that would serve as motivation. Reconsideration of claim 7 is therefore requested.

5. Rejection on claims 8-10 under 35 U.S.C. 103(a):

As claims 8-10 are dependent upon claim 6, they should be allowable if the amended claim 6 is allowed. Reconsideration of claims 8-10 is therefore politely requested.

Sincerely yours,

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Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 13 hours behind the Taiwan time, i.e. 9 AM in D.C. = 10 PM in Taiwan.)